

**We Claim:**

- 5 1. An injection molding apparatus comprising:  
a manifold having a manifold channel for receiving a melt stream of  
moldable material under pressure;  
a manifold plug provided in said manifold, said manifold plug having a  
manifold plug channel formed therein, said manifold plug channel having an inlet  
receiving the melt stream from said manifold channel and an outlet delivering the melt  
stream to a nozzle channel of a nozzle, said manifold plug channel undergoing a  
10 change in direction between said inlet and outlet;  
a mold cavity receiving said melt stream from said nozzle, said nozzle  
channel communicating with said mold cavity through a mold gate;  
a valve pin passing through a bore provided in said manifold plug and  
extending into said manifold plug channel and said nozzle channel, said valve pin  
15 being movable to selectively open and close said mold gate; and  
a guide projecting from an inner wall of said manifold plug channel,  
diametrically opposing said inlet, said guide being located behind said valve pin and  
abutting a portion of said valve pin.
- 20 2. An injection molding apparatus as claimed in claim 1, wherein said  
guide provides a restriction to the flow of said melt stream.
3. An injection molding apparatus as claimed in claim 2, wherein said  
guide is integrally formed with the inner wall of said manifold plug channel.
- 25 4. An injection molding apparatus as claimed in claim 3, wherein said  
guide presents a guide surface extending towards said outlet between of a lower edge  
of said bore and a predetermined location on an inner surface of said manifold plug  
channel.
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5. An injection molding apparatus as claimed in claim 4, wherein said inner wall tapers toward said guide surface to form a smooth transition between said inner wall and an edge of said guide surface.

5 6. An injection molding apparatus as claimed in claim 5, wherein said guide surface tapers to a point in a direction away from said bore.

Sub A4 7. A manifold plug comprising:  
10 a manifold plug body including a manifold plug channel having an inlet and an outlet formed therein;  
a guide-body projecting from an inner wall of said manifold plug body diametrically opposing said inlet, said inlet for aligning with a manifold channel of a manifold and said outlet for aligning with a nozzle channel of a nozzle, said inlet being at an angle to said outlet; and  
15 a guide surface provided on said guide body, said guide surface abutting a downstream portion of a valve pin extending through said manifold plug body.

8. A manifold plug as claimed in claim 7, wherein said guide facilitates  
20 flow of a melt stream of moldable material through said manifold plug channel between said inlet and outlet.

9. A manifold plug as claimed in claim 8, wherein said guide is integrally  
25 formed with said inner wall.

10. An injection molding apparatus comprising:  
a manifold having a manifold channel for receiving a melt stream of  
moldable material under pressure and delivering said melt stream to a nozzle, said  
manifold channel undergoing a change of direction from an inlet to an outlet and  
30 being aligned with a nozzle channel of said nozzle;

a mold cavity for receiving said melt stream from said nozzle, said nozzle channel communicating with said mold cavity through a mold gate;

a valve pin extending through a bore provided in said manifold and through said nozzle channel, said valve pin being movable to selectively open and close said mold gate; and

a guide projecting from an inner wall of said manifold channel, diametrically opposing said inlet for restricting the flow of said melt stream, said guide being located behind said valve pin and abutting a portion of said valve pin.

10 11. An injection molding apparatus as claimed in claim 10, wherein said guide facilitates flow of said melt stream through said manifold.

12. An injection molding apparatus as claimed in claim 11, wherein said guide is integrally formed with an inner wall of said manifold channel.

15 13. An injection molding apparatus as claimed in claim 12 for use in a dynamic feed application.

20 14. An injection molding machine as claimed in claim 1, wherein said valve pin regulates the flow of said melt stream through said nozzle towards said mold cavity.

25 15. An injection molding machine as claimed in claim 1, wherein said valve pin regulates the flow of said melt stream through said manifold towards said nozzle and said mold cavity.

30 16. An injection molding machine as claimed in claim 1, wherein said valve pin regulates the flow of said melt stream through said manifold and through said nozzle towards said mold cavity.

17. An injection molding machine as claimed in claim 10, wherein said valve pin regulates the flow of said melt stream through said nozzle towards the mold cavity.

5 18. An injection molding machine as claimed in claim 10, wherein said valve pin regulates the flow of said melt stream through said manifold towards said nozzle and said mold cavity.

10 19. An injection molding machine as claimed in claim 10, wherein said valve pin regulates the flow of said melt stream through said manifold and through said nozzle towards said mold cavity.

20. An injection molding machine comprising:  
a manifold having a manifold channel for receiving a melt stream of  
15 moldable material under pressure;  
a manifold plug provided in said manifold;  
a manifold plug channel formed in said manifold plug for receiving  
said melt stream from said manifold channel, said manifold plug channel undergoing a  
change of direction from an inlet to an outlet thereof, said inlet being aligned with said  
20 manifold channel and said outlet being aligned with a nozzle channel of a nozzle for  
delivering said melt stream to said nozzle; and  
a melt flow restriction element projecting from an inner wall of said  
manifold plug channel, diametrically opposing said inlet.

25 21. An injection molding machine comprising:  
a manifold having a manifold channel for receiving a melt stream of  
moldable material under pressure and delivering said melt stream to a nozzle, said  
manifold channel undergoing a change of direction from an inlet to an outlet; and  
a guide projecting from an inner wall of said manifold channel,  
30 diametrically opposing said inlet for restricting the flow of said melt stream.